Competency mapping and visualisation techniques in change management

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ABSTRACT

Purpose: The article describes techniques that may facilitate change management in the library.
Approach: The paper is based on practical experience and evidence from the INIST library department in France.
Findings: Based on standard inventories of LIS professions and competencies, we present techniques for the mapping and visualisation of individual or team-centred job functions and skills. These techniques can help and facilitate communication, information and participation and are useful for staff development, workplace training and individual coaching.
Originality: The proposed techniques combine the ECIA Euroguide of competencies, survey methods (mapping) and visualisation techniques as decision aids and participatory management tools for change management.

KEYWORDS

Change management, staff development, evaluation, visual aids, skills, ECIA guide.

PAPER TYPE

Technical paper.

1. ISSUES

The new information technologies introduce fundamental modifications in the traditional library functioning and organisation. These modifications produce a direct and continuous impact on human resources, e.g. professional skills, job descriptions and training programs (Bawden et al., 2005), and they are often source of stress, insecurity and unease at the working place. Change management must cope with feelings of anxiety and loss of autonomy and control, but how?

Evaluation and self-evaluation techniques are part of change management tools (Leong, 2008). Gain better and realistic understanding of competencies and skills, obtain an objective view on gaps and needs of training, merge individual coaching with team-centred communication can reduce fear and prepare necessary changes (Tikkanen and Pölönen, 1996).

This paper proposes techniques that may prepare and facilitate change management in the library environment, especially in larger organisations. The goal is threefold: enable and accompany the process of change, provide a decision aid for job development and training programs, support and develop information and communication with the LIS practitioners.

The importance of visualisation tools for participatory management, shared understanding and decision process has been highlighted by Platts and Tan (2004).

The techniques were successfully applied during the initial transition period from print to digital resources in the INIST[1] library department from 2002 to 2004, with about 60 librarians. The originality of this experience was the use of standard tools of professional skills, mapping and visualisation techniques, and participative management in order to facilitate understanding of the transition to the digital library and prepare for change.

The following paper is derived from this experience, except one detail: while we worked with a prior version of the ECIA guidelines (2001), all examples in this article are taken from the second revised edition (ECIA, 2004).

2. JOB DESCRIPTION AND INVENTORY OF SKILLS

Enabling job development implies a precise description of workplace, activities and competencies[2]. In a given organisation, this formalised description may be incomplete, obsolete or otherwise invalid, or may not exist at all. Whatever the case may be, an updated inventory of job functions, activities and competencies is a necessary condition for the preparation of change management.

2.1. Job description

Therefore the first step is to determine the different professional situations and functions in the given library environment. Each job is defined by its objective (mission), activities and skills and also, by the level of recruitment and salary.

It is helpful for both the management and staff to use standard instead of "ad hoc" (institution-specific) tools because they embed the internal project in the global professional environment, allow for better and objective understanding of job development and help sharing goals.

In the INIST project, we used a prior version of the French CNRS[3] professional inventory REFERENS that includes in its latest and revised edition 56 job descriptions for LIS practitioners, ranging from scientific information and library to publishing and communication (CNRS, 2007). During the initial phase of change management at the INIST library, the CNRS inventory supplied an objective underpinning for the work on job definition. The result was a map of 12 positions and

[1] INIST = French Institute for Scientific and Technical Information with about 350 employees, see http://www.inist.fr or Schöpfel (2003).

[2] Competencies = "a set of skills necessary to perform a professional activity and the proficiency of required behaviour" (Tammaro, 2005 p. 70); they are "principally and conceptually related to training tasks" (Anderson, 2007 p. 100).

[3] CNRS = French National Scientific Research Centre with about 30,000 scientific and technical staff, see http://www.cnrs.fr. INIST is part of the CNRS, and the INIST agents are employees of the CNRS.

functions in the library independent from its organisational structure and linked to the CNRS inventory. The map contained profiles for "Library System Manager", "Serials Catalogue Librarian", "Acquisition Librarian" etc. The complete format for each description includes information on goals (mission), evolution (tendency), principal and associated activities, principal and associated competencies (with different fields of expertise such as general and operational knowledge, linguistic skills etc.), professional environment (workplace and work conditions), minimum qualification and training level.

The work was prepared with the library managers but discussed, modified and validated with the whole library staff to be sure that each staff member was able to situate him/herself on this map.

2.2. Inventory of skills

The second step is to evaluate professional expertise. Again, it is important to associate the whole staff from the beginning on and to use standard tools for the scaling of individual and collective skills.

Produced by the "European Council of Information Associations" (ECIA)[4] with the support of the European Commission and published in nine languages, the *Euroguide LIS* (ECIA, 2004) appears to be the most important international inventory of competencies for information professionals (see Tammaro, 2005 p. 70 and Anderson, 2007 p. 102). In particular, two of its goals are of interest for change management: "identifying the expertise that (the working professional) must acquire or improve to remain competitive" and "undertaking a training course where (the professional) will acquire supplementary expertise" (ECIA, 2004 p. 10).

The 2nd edition contains 33 fields of expertise, divided into five groups:

Group I – Information

12 fields of expertise (relations with users and clients, information seeking, management of collections...)

Group T – Technology

5 fields of expertise (computer based design of information systems, publishing and editing...)

Group C – Communication

7 fields of expertise (oral communication, using a foreign language, institutional communication...)

Group M – Management

8 fields of expertise (marketing, budgetary management, diagnosis and evaluation...)

Group S – Other scientific knowledge

x field(s) of expertise of another or other disciplines, apart from information services (additional fields: economic, legal, linguistic, psychological...)

For each field of expertise the ECIA examples are organised by levels of competence (degrees), from Level 1 (awareness - use of available tools and basic knowledge of the

[4] ASLIB (UK), DGI (D), ADBS (F) etc. .

field) to Level 4 (effective use or mastery of methodology). The examples allow for comparison with real situations, e.g. for evaluation and self-evaluation.

To be used for evaluation with individuals or groups, the list of fields can be transformed in separate evaluation scales with four values (level 1 low expertise – level 4 high expertise), for instance:

Group T – Technology

T01 – Computer based design of information systems	*Level*	*1 – 2 – 3 – 4*
T02 – Computer based development of applications	*Level*	*1 – 2 – 3 – 4*
T03 – Publishing and editing	*Level*	*1 – 2 – 3 – 4*
T04 – Internet technology	*Level*	*1 – 2 – 3 – 4*
T05 – Information and computer technology	*Level*	*1 – 2 – 3 – 4*

The examples for each field and level should be explained and supplied together with the evaluation scales.

As for the job description before, the inventory of skills was carried out in a participatory way, combining evaluation and self-evaluation and shared validation.

In the INIST project, we used the ECIA inventory only for job- or team-centred evaluation. In other words, we asked members of the staff and the management to scale the different skills for a specific job function and/or a whole team (service) but not for individuals (staff members). The person-centred evaluation was not necessary in this initial phase of change management where the focus was on team-centred enabling and support.

3. MAPPING OF JOB FUNCTIONS AND COMPETENCIES

After the description of different job functions and the evaluation of professional competencies, the next step is to map functions and competencies in order to gain insight in the distribution, differences and convergences of activities and skills.

In fact, the mapping can and should be done in two opposite directions: mapping competencies to job functions, and mapping job functions to competencies. Again, this is to be done together with the whole staff.

3.1. Mapping skills to job functions

In the first case the principal question is: for a given and defined job function, which expertise (competencies) is used and/or needed, and on which level of expertise?

The resulting table consists of a list of job function related to one or more competencies. An illustration from the INIST project where we tried to link for each of the 12 job functions the corresponding expertise fields from the ECIA inventory:

Job function:

Serials Catalogue Librarian.

Related competencies (taken from the ECIA guide):

I05 Identification and validation of information sources - level 2 ("use the tools and methods currently available to identify sources of information…" etc.).

I06 Analysis and representation of information – level 2 ("carry out the subject cataloguing for a batch of documents…" etc.).

C04 Computerized communication – level 3 ("use the advanced calculating functions of spreadsheet software…" etc.).

C05 Using a foreign language – level 2 ("understand and be able to express himself/herself intelligibly in daily life and professional situations" etc.).

Figure I illustrates this technique for three job functions.

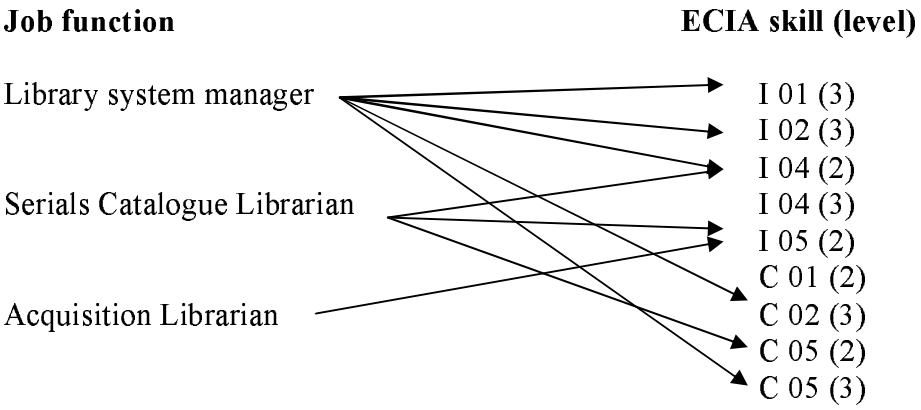

Figure I. Mapping skills to job functions

The competencies are listed for each function and then compared to the job definition, to detect eventual incoherencies. For instance, in the initial stage of the INIST project, we obtained 4 to 11 different skills related to each of the 12 job functions, with a total number of 76 competencies, a lot of them being shared between different job functions.

3.2. Mapping job functions to skills

In the second case the principal question is: for a given competency (skill), which is/are the job function(s) where it is realized and/or needed, and on which level of expertise?

Here, the resulting table is a list of competencies on different levels of expertise related to one or more job functions. Again, an example from INIST:

Competency (ECIA guide):

C01 Oral communication

Related job functions for level 1 ("welcome and put at ease visitors or participants in a meeting" etc.):

Librarian in the Serials Reception Area

Related job functions for level 2 ("give an oral account of a meeting" etc.):

Library system administrator
Serials Catalogue Librarian

Related job functions for level 3 ("explain in detail a procedure or the stages of a process" etc.):

Records and library data manager
Acquisition librarian

Again, a figure may illustrate this technique.

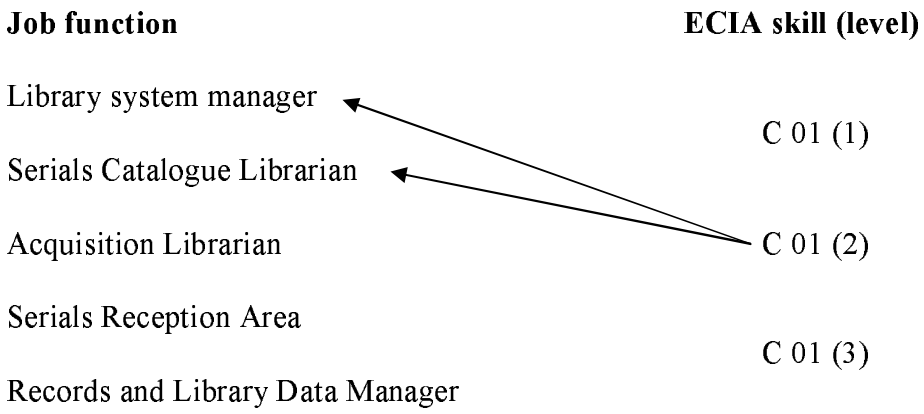

Figure II. Mapping job functions to skills

The different job functions are linked to each expertise field and then compared to the inventory of competencies to detect incoherent mappings. At INIST, we obtained a list of 17 competencies with 1 to 3 levels for each, totalling 28 different expertise levels.

3.3. Interconnection of the two mappings

The final step of the technique consists in merging the two mappings into the same table, e.g. interconnecting the two lists of job functions and competencies. This interconnection can be visualized as follows:

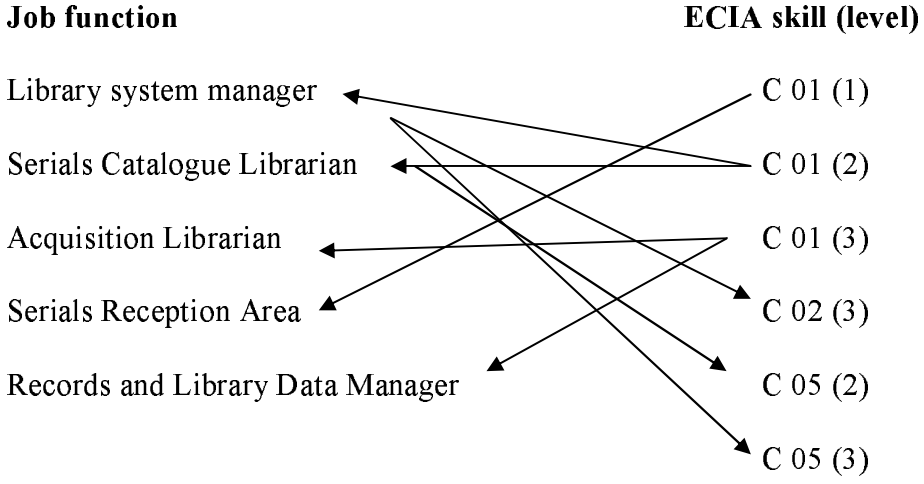

Figure III. Interconnecting job functions and skills

This double counter-mapping provides a graphical illustration and allows for an intuitive understanding of incoherent evaluation, competency clusters, similitude of jobs in different services but with transversal profiles etc. In the INIST project, this visual aid roused a most animated debate especially on the job functions with few and or low-level expertise fields (for instance, in the serials reception area) and raised awareness on the necessity to enrich certain jobs in the whole library production chain.

4. VISUALISATION OF COMPETENCY PROFILES

Another visual aid that may support understanding of skills and expertise is the use of Excel graphics. We opted for Radar charts that display the aggregated values of the data series from skills evaluation (cf. above) relative to a center point. In the INIST project, we used the Radar charts for three different types of evaluation.

4.1. Quantifying the collective skills in a specific field of expertise

Based on the mapping of job descriptions and competencies, the quotations of each competency (expertise field) are counted. An example from the INIST study:

Field of expertise (ECIA)	#
I 05 Identification and validation of information sources	14
I 04 Contents and knowledge management	10
I 02 Understanding the LIS environment	7
I 07 Information seeking	6
I 01 Relations with users and clients	5
I 10 Material handling of documents	1
I 06 Analysis and representation of information	1
I 12 Conception of products and services	1

Figure IV. Quantifying a field of expertise (INIST example)

Using the mapping procedure described above, the number of jobs of a library team linked to specific fields of expertise of the ECIA group of competency "I – Information" was counted and the total amount was entered into the table. We then visualised the result in the following way:

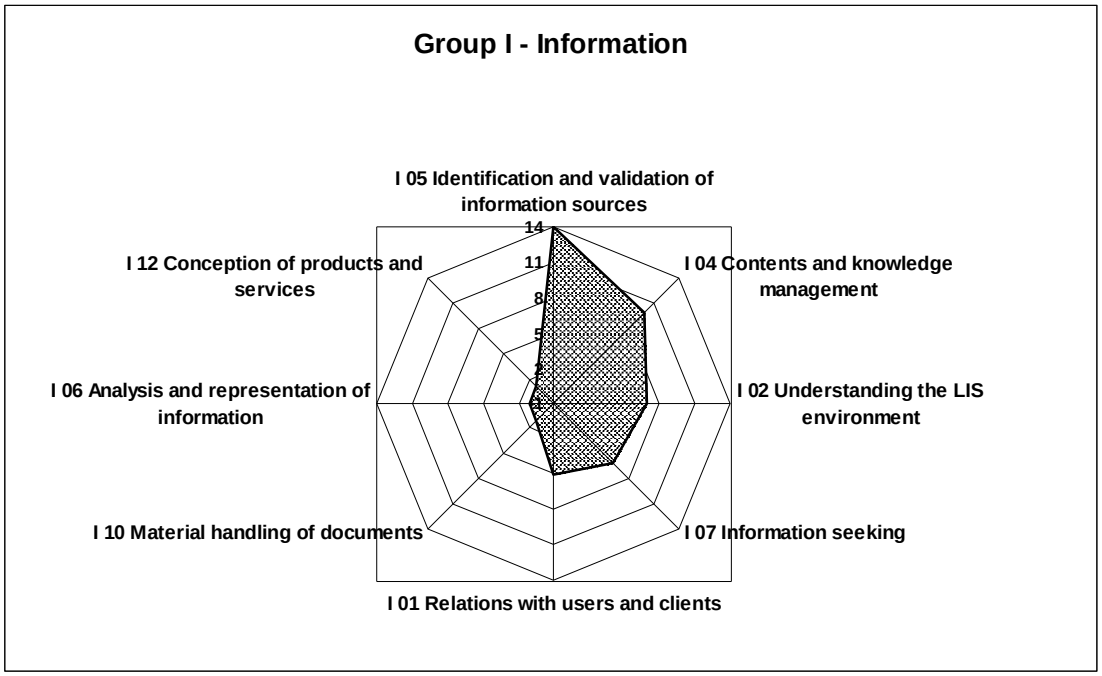

Figure V. Visualisation of collective skills in a group of expertise (INIST example)

Better than words, the Radar chart allows for intuitive understanding of the skills profile of this specific team, of its strong and weak points.

4.2. Level of expertise

Nevertheless, this chart says nothing on the level of expertise. Therefore we used the quantified results of skills evaluation (level 1 to 4) for each specific expertise group and visualised their sum (total amount) per level and group. The following example illustrates the expertise level for the ECIA group "C – Communication" for a given library team:

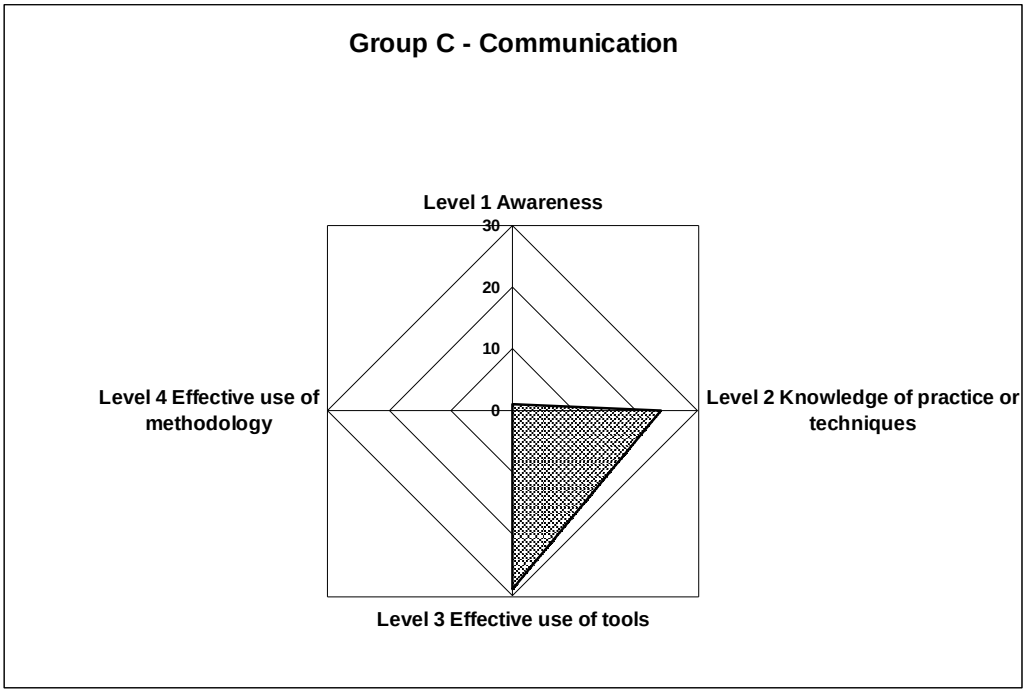

Figure VI. Level of skills in a group of expertise (INIST example)

Obviously, in this team skills are mostly performed on levels 2 (knowledge of practice) and 3 (effective use of tools) without attaining mastery in one or more communication skills.

This visual aid is useful when mapped with job descriptions, e.g. salary and/or qualification levels in a give team.

4.3. Groups of competencies

Finally, the visualisation technique was used to support the understanding of differences between the different groups of competencies. Again, as in the first example only were counted the quotations of skills without quantifying levels of expertise. But then these counts were summed up for each ECIA group of expertise:

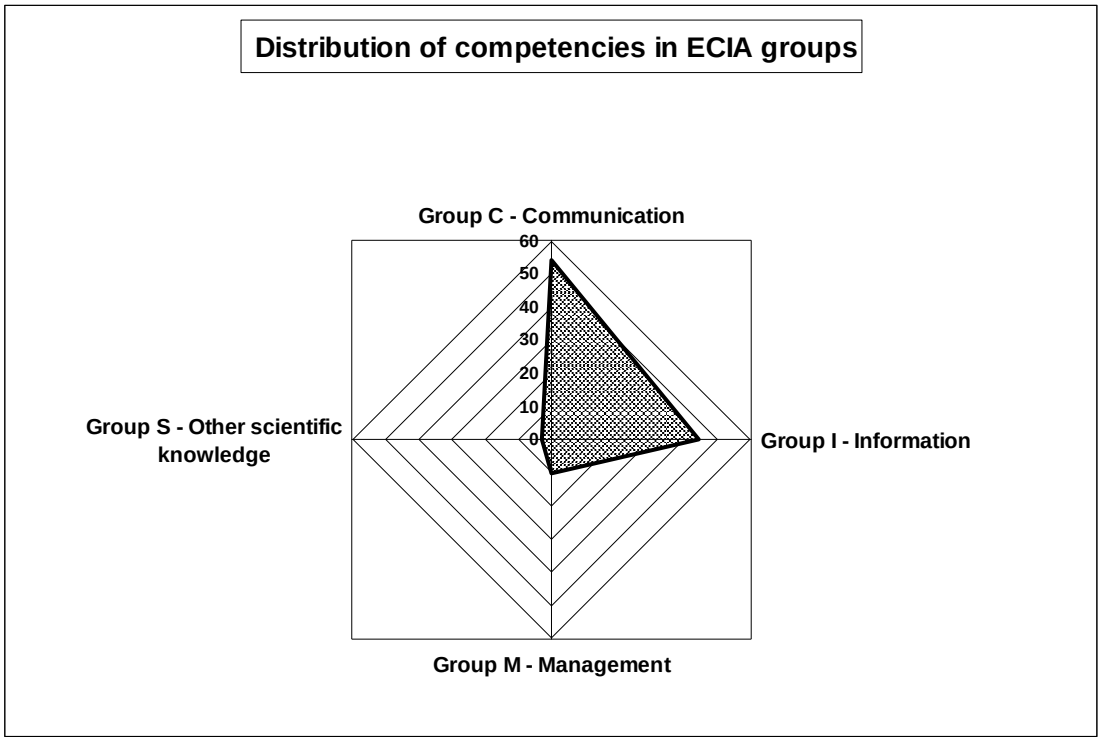

Figure VII. Comparison of collective skills in different groups of expertise (INIST example)

Again, this visualisation provides a simple and intuitive tool for the communication and comprehension of the global distribution of skills and expertise in a given structure (team, service, department, or organisation). -

These are but three rather simple examples of the use of visual aids for the evaluation of competencies. Of course, other data and profiles can be illustrated in the same way, for instance on an individual level or to compare team performances in a given skill. Yet, our intention was not to develop a sophisticated toolkit for human resource management but to prepare and facilitate the transition from print to digital resources in the library, e.g. change management. So our choice was to keep the illustrations as simple (and intuitive) as possible and to address only some main results, in order to highlight the major stakes and matters.

5. CONCLUDING REMARKS ON PARTICIPATORY MANAGEMENT

The described techniques are not specific to change management but can support and facilitate it, especially in the initial phase of preparation. Following our experience, their effective application depends on a good knowledge of the professional environment, on a clear definition of purpose and rationale, and on the participation of the whole staff.

It must be clear and transparent from the beginning on what the intention is of this inventorying, mapping and visualisation. Is it to know which are the jobs, activities, skills fields and levels (expertise) in a team or service? Is it to identify missing jobs and/or skills (gaps) compared to the requirements of new technologies of information and the digital library? Is it for training programs or decisions on outsourcing, staffing, restructuring or reengineering?

For all these objectives, the described techniques are not an answer but a means that can facilitate understanding, commitment and preparedness for change. But to be effective, they should be clearly situated in the context of the whole project of change. Visuals aids if well embedded can be powerful decision aids.

Finally, as Leong (2008) pointed out, participatory management style and investment in staff development are necessary for the success of change management.

For our purpose this means that the analysis of the inventory, its comparison with the real work environment and the job description should not be done by one or a few experts but should become part of a collective project of change, should be appropriated by the whole team.

This means also that the evaluation should cover both individuals and work teams and that it should proceed on both levels, as person- and team-centred evaluation of activities and skills. A "holistic" or systemic, team-centred approach can not, must not substitute a person-centred approach to training, coaching and job development.

Even if the whole project is conducted and supervised by a task force (project and library managers, experts), the major work should be done together with the whole staff. For instance, evaluation and self-evaluation should be used to validate the procedure, to compare results, to fix and rectify methodological and/or professional bias. This is of course time-consuming, particularly in the initial phase of the project, and the impact on workload needs to be addressed and monitored. -

As said in the beginning, all change is a potential source of stress and anxiety. Communication, information and participation are the main vectors to help people cope with this job-related stress. The described techniques of inventorying, mapping and visual aids are useful tools that facilitate and support these vectors.

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